



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/590,706	05/17/2007	Susumu Tsukamoto	2006_1404A	3816
513 7590 12/19/2011 WENDEROTH, LIND & PONACK, L.L.P. 1030 15th Street, N.W., Suite 400 East Washington, DC 20005-1503				
EXAMINER				
PAIK, SANG YEOP				
ART UNIT		PAPER NUMBER		
3742				
NOTIFICATION DATE		DELIVERY MODE		
12/19/2011		ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ddalecki@wenderoth.com  
coa@wenderoth.com

**Office Action Summary****Application No.**

10/590,706

**Applicant(s)**

TSUKAMOTO ET AL.

**Examiner**

SANG PAIK

**Art Unit**

3742

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 03 October 2011.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on \_\_\_\_; the restriction requirement and election have been incorporated into this action.
- 4) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 5) ☒ Claim(s) 2, 3 and 5 is/are pending in the application.
- 5a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 6) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 7) ☒ Claim(s) 2, 3 and 5 is/are rejected.
- 8) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 9) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 10) ☐ The specification is objected to by the Examiner.
- 11) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 12) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SD-03)  
Paper No(s)/Mail Date \_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_

**DETAILED ACTION**

***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 2, 3 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsukamoto et al (US 2004/0026381) in view of Terada et al (US 5,155,329), Chou et al (US 5,961,859), and Kearney (US 4,446,354).

Tsukamoto shows the laser welding method claimed including a laser that is set to control a varied waveform and frequency of the welded portion to prevent weld defects wherein the frequency of the laser output is conformed to the frequency of the welded portion/component such as a molten metal (see page 2, [0032]). Tsukamoto further shows that the laser output is varied including a first laser output  $W_p$  and a second output  $W_b$  as shown in Figure 4 and controlled to achieve a desired peak output  $W_p$  to increase the amplitude of the welded component (see [0034] to [0036]), and the setting of the laser output so that the light emission strength becomes to a minimum threshold is shown to be about 10 ms that is between the threshold minimum to a rise time  $T_u$ .

But, Tsukamoto does not show the method of detecting a time change in light emission strength of plasma or plume generated from the welded portion to obtain the amplitude of frequency component.

Terada shows that it is known in the art that the welded conditions are monitored and determined by the light intensity emitted from the welds and that the time change of the light intensity correlates with the varying waveforms of the laser as illustrated in Figures 4 and 6 wherein Terada also shows the laser out that correlates with the light emission strength which is set to a minimum threshold value in about 9 ms (column 4, lines 33-43). Chou also shows that it is well known in the art that the welded condition such as the size of the weld plasma is monitored and determined by the intensity of the light emission of the welded portion (see abstract, and also see column 3, lines 8-18). Kearney also shows that it is well known that the amplitude and wavelength of radiation emitted by the welding arc or plasma is detected by a sensor to determine the welded portion conditions.

In view of Terada, Chou, and Kearney, it would have been obvious to one of ordinary skill in the art to Tsukamoto with analyzing the frequency and amplitude of the welded portion/component by detecting the time change in the light emission strength of the welded portion wherein the intensity of the light emission is known to be correlated with the plasma size or amplitude of the welded portion/component wherein the variation of the light emission is also shown to be representation of the laser output such it would have been obvious to one of ordinary skill in the art to adapt the laser output in Tsukamoto is set or controlled to increase or achieved a desired maximum

amplitude of the frequency of the welded portion/component and further prevent weld defects.

***Response to Arguments***

3. Applicant's arguments filed 10/3/11 have been fully considered but they are not persuasive.

The applicant argues Tsukamoto fails to vary a waveform and a frequency of a laser output in a controlled manner to prevent occurrence of weld defects so that the amplitude of the frequency component becomes a maximum. This argument is not deemed persuasive since Tsukamoto clearly shows the laser output variations including the waveform and frequency as shown by Figures 2 and 6. Also see para [0006], [0026], and [0033 to 0043]. With respect to detecting the time change in light emission strength to obtain the amplitude of a frequency component, Terada has been applied to show that such monitoring of the light intensity is known in the art as applied in the ground of rejection. Thus, the combined Tsukamoto and Terada shows the recited welding method to adapt the laser output to be controlled to increase or achieve a desired maximum amplitude frequency to produce the maximum output without weld defects.

The applicant argues Terada and Chou fail to detect a light emitted from a plasma, but this argument is not deemed persuasive sine the light emitted from the molten pool is the light that is produced by the plasma reaction where the applicant also discloses the plasma or plume to be the interaction between the laser and the material to be welding (see page 7 of the applicant's specification).

The applicant argues the applied art does not teach the recited steps of "detecting", "analyzing", and "setting" steps. But, this argument is not deemed persuasive since as Tsukamoto performs the laser output that is set based on the oscillation frequency of the molten metal/component wherein the oscillation frequency is detected and analyzed via x-ray examinations for weld-defects and that the welding performance is further analyzed when irradiated with laser output WB and WP in terms of defect occurrence ratio. Thus, Tsukamoto shows a basic detecting, analyzing, and setting steps wherein the secondary references Terada, Chou, and Kearney have been applied to teach an alternative means that is known in the art for detecting and analyzing the welding conditions in terms of time change in light emission strength that would be correlated to the laser output. Such teaching would have been applicable to Tsukamoto as stated in the ground of rejection. Thus, the applicant's arguments are not deemed persuasive.

4. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to SANG PAIK whose telephone number is (571)272-4783. The examiner can normally be reached on M-F (9:00-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tu Hoang can be reached on (571) 272-4780. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/SANG Y PAIK/

Primary Examiner, Art Unit 3742